

Claims

1. A method of reducing growth of microbial spoilage organisms on a perishable product comprising the steps of:
 - a) arranging perishable products in a matrix within a substantially closed environment; and
 - b) introducing into the substantially closed environment a gaseous mixture of air and ozone at a prescribed concentration, the prescribed ozone concentration being a selected concentration in the range of around fifty to five hundred parts per billion (ppb) in air.
2. A method as claimed in Claim 1, wherein the prescribed concentration is in the range of around fifty to around two hundred ppb.
3. A method as claimed in Claim 2, wherein the prescribed concentration is in the range of around fifty to around one hundred ppb.
4. A method according to any preceding claim, wherein the prescribed concentration is fifty or one hundred or two hundred or five hundred ppb.
5. A method according to any preceding claim, comprising the further step of maintaining the relative humidity in the enclosed environment at around ninety five percent.
6. A method according to any preceding claim, comprising the further step of maintaining the temperature in the enclosed environment at four to thirteen degrees C.

7. A method according to any preceding claim, wherein the substantially closed environment consists of a crop store, a warehouse, or a freight transport container.
8. A method according to any of Claims 1 to 6, wherein the substantially closed environment surrounds a food handling or packing station, the said products being subjected to the gaseous mixture containing the prescribed concentration whilst being handled or packed.
9. A method according to any of Claims 1 to 6, wherein the substantially closed environment consists of a sealed food package.
10. A method according to any of Claims 1 to 8, comprising the further step of measuring the concentration of ozone in the environment, and introducing a measured volume of ozone into the environment when the measured concentration of ozone falls below the prescribed ozone concentration.
11. A method of vaccinating a perishable product against growth of microbial spoilage organisms in a period of effective vaccination comprising the step of:

performing the method as claimed in any preceding claim on perishable products for a treatment period;

wherein the period of effective vaccination resulting from ozone exposure in the treatment period is between two and five hundred hours.

12. A method as claimed in Claim 11, wherein the treatment period resulting in effective vaccination of perishable produce is between around two and around five hundred hours.
13. A method as claimed in Claim 11, wherein the vaccination period is between two and eight hours.
14. Apparatus for performing the method of Claim 10 or 11, comprising an ozone generator, an ozone sensor and a controller, wherein generated ozone is released into the environment until the prescribed ozone concentration is reached, and wherein the ozone sensor measures the concentration of ozone in the environment, and when the measured concentration of ozone falls below the prescribed ozone concentration the controller commands the ozone generator to release ozone into the environment, so as to maintain continuously the ozone concentration in the environment substantially at the prescribed concentration.
15. Apparatus according to Claim 14, wherein ozone is released into the environment by the ozone generator via a plurality of inlets.
16. Apparatus according to Claim 14 or 15, comprising a plurality of ozone sensors.
17. Apparatus according to any of Claims 14 to 16, wherein the controller includes computer software, the software including an model representative of the of gaseous fluid behaviour in the environment, and wherein ozone is released into the environment according to the concentration of ozone measured by the or each sensor, and the gaseous fluid behaviour model.

18. Apparatus substantially as shown in, and as described with reference to, the drawings numbered 1 to 3.